AUDECIBEL

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Vol. III No. 6

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JOURNAL OF THE SOCIETY OF HEARING AID AUDIOLOGISTS

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The Purpose. ***Audecibel*** **is strictly an educational and professional journal, the purpose of which is to bring to the otologist, the hearing aid audiologist and others interested in the field of hearing and audiology, authoritative articles, papers and data concerned with research, techniques, education and new developments in the field of treating and assisting the hard of hearing.**

The Goal. **The** ***Society of Hearing Aid Audiologists*** **is dedicated to the goal of reaching and maintaining the highest possible ethical standards in the field of hearing aid audiology. •** ***Audecibel*** **is dedicated to the goal of rapport among all those concerned with the hard of hearing so that mutual and overlapping problems may be recognized, and outstanding ideas, skills and experiences be shared for the greater benefit of all. You are urged to write in for details of how YOU may participate in and benefit by this worthwhile endeavor.**

AUDECIBEL

Official Publication of the Society of Hearing Aid Audiologists

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From the Editor's Notebook . . .

Many requests are coming in for reprints of "I Will Speak." If you haven't ordered yours, you had better do so . . . Thanks for the many compliments on the October issue. We thought it was kinda nice . . . Yes, reprints are available on Wm. Waldrop's article . . . Dr. Harvey Fletcher's article, this issue, is complete and reprints can be had upon request—@10c each in lots of 100 to 900 and @5c each in lots of 1000 or more, minimum quantity 100 . . . Here's a book that is a must—"Freedom from Fear" by Lester L. Coleman, M.D., one of America's leading otologists. P.S., we can get for you at a discount. . . Prexy Nisonger, American Hearing Society, says of Audecibel, "This magazine should be of great service to hearing aid audiologists." Thanks . . . More and More public school districts are subscribing to Audecibel. Today's mail brings one from the City of San Bernadino High School District, San Bernadino, Calif. Send copies to your schools . . . c/o Supt. of Special Education, also to your Professional Library . . . CBS is scheduled to televise at 4:30 p.m. EST, Sunday, December 19th, on their series "The Search," a show concerned with hard of hearing children and the selection of aids for them. The film was taken at the Johns Hopkins Hospital, Hearing And Speech Center of which Dr. William G. Hardy is Director.

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and
A Merry Xmas
To All

Thornton Zanolli

Walter L. Metcalfe

Kenneth S. Wood

As we turn each page of the New Year
let us be mindful that we stand
upon the threshold of an unexplored day.
No man has traveled here before
us, so let us approach each day with full
courage and an adventurous spirit.
May you find all of yours filled with
high adventure, love, health, happiness
and the fulfillment of your heart's
desires.

Max Elbaum

Grover C. Coil

The Officers
and Governors of

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. . . and the Staff
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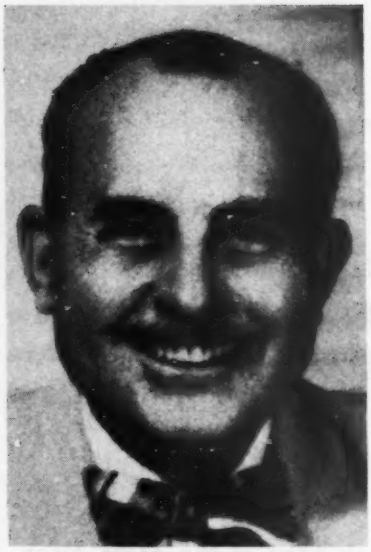


Grover C. Coil Resigns

by Arthur E. Brennan

Grover C. Coil, of Grover C. Coil and Associates, 6 N. Michigan Ave., Chicago, Ill., has announced his resignation as executive director of the Society of Hearing Aid Audiologists, effective November 15, 1954.

Mr. Coil, who first started in the retail hearing aid field in 1920, has been executive director of the Society since it was organized in July, 1952, as a separate ethical and education society growing out of the International Hearing Aid Association of which he was Executive Secretary. Mr. Coil also had been chairman of the planning committee and chairman of the organizing convention of the IHAA which was formed in 1948.

Mr. Coil has given many years to this cause at considerable personal sacrifice, having had to give up a major part of his personal business to devote necessary time to the Society.

In announcing his resignation, Mr. Coil issued the following statement:

"It isn't easy working for a lot of bosses—and that is what an executive director must do. Nor is it easy to steer a wise course among the shoals of business and professional politics—yet this is one of the principal jobs of an executive director.

"In trying to reconcile the opposing factions within and without the Society, only a superman could pacify and keep happy all the members. The great mass of the members are pleasant, friendly, helpful, cooperative, charming and efficient. Although sometime we fight with them, we like them all.

"Though some members have not always seen eye to eye with me on matters of policy, none can deny my willingness to do a lot of hard work, nor my intense loyalty to the Society. Perhaps without this almost religious zeal, plus the warm friendship and staunch support particularly of President Zanolli as well as that received from all of the other officers and the membership as a whole the hardships and discouragements could not have been endured.

"The Society, in order to raise the additional funds required to carry out its plans and objectives to full completion, has, in my opinion, a choice of two courses to follow: (1) Open the doors in some manner to double its membership and income from fees. This presumes a long and slow ethical and educational program pointed at raising standards of those engaged in the retailing of hearing aids.

"(2) Tighten up the present organization, making the entrance requirements more rigid, and also demanding that additional minimum standards be established for fitting and testing, as well as insisting that approved testing apparatus be in use in the office of members as a prerequisite to obtaining and the maintenance of certification.

"In connection with the latter, I would recommend a definite training and refresher course for members and maintenance of ethical standards; raising of the entrance fee to a minimum of $100 and annual certification fees of $100 per person; only such persons should be permitted to use the phrase 'Certified Hearing Aid Audiologist.'

"In addition, I would recommend the establishment of a category for honorary members and affiliate members, which would include those not actually engaged in the retail fitting of hearing aids. I would also recommend a category for apprentices, with membership in the apprentice classification limited to not more than three years, at which time an apprentice would be admitted to full membership or be dropped.

"I believe it is essential that hearing aid dealers who are members of the Society should engage in an active program to defend themselves from the flood of publicity and advertising aimed at diverting purchasers from their doors.

"S.H.A.A. members must get across to the public why a hard of hearing person should patronize their (certified) establishment rather than some other where they might get less satisfactory service.

"If the hearing aid retailers wish to contribute to the funds of the manufacturers' association (A.H.A.A.), that is fine, but it should not be on the basis of *'taxation without representation.'* The dealers should have *full voting power to the exact proportion of their contribution* to the total.

"I have explained my position and reasoning in these matters in many conversations and in a letter to the President, Mr. Thornton Zanolli, expressing my desire to be relieved of the worries and tensions connected with this position. I feel that now is the time for someone else to pick up the torch." There are many able and willing hands to continue the work.

The purposes of the Society have been well outlined and its basic organization is well in hand. With strong, positive leadership and support from the field it cannot fail to accomplish its goal.

Audecibel has proven its worth and has been accepted in all of the branches of the large field of audiology as *the Journal of Audiology.* Continuing in the future to serve all branches of audiology and resisting any pressures that might cause it to become the tool of special interests, its success is certain.

Mr. Coil, a native of southwestern Missouri, came to Chicago in 1913 to continue the study of international law with an eye upon a diplomatic career. His plans, however, were interrupted by World War I, when he went into the army in 1917 as a private and served in France as a captain of artillery.

After a short period as a junior executive of Sears Roebuck & Co., he entered the hearing aid field in 1920, selling the non-electrical and carbon types. In 1935, he became district sales manager for Western Electric hearing aids in the central division, later going to the New York office of Graybar as hearing aid adviser. He became national sales manager, hearing aid department, of Graybar in 1940.

He later was an administrative consultant in the hearing aid division of Zenith and, in 1944, went to Aurex as assistant to the president and general sales manager. In 1947, he went to Allen-Howe Electronics Corp. as director of sales, to help launch the first hearing aid—in fact the first commercial device of any kind

—to contain a printed circuit. He opened his own business in Chicago in 1949.

Mr. Coil is married, and has four daughters and eleven grandchildren. He is a 32nd degree Mason, and a member of the Military & Naval Club of New York, Trade Association Executives Forum of Chicago, Chicago Kiwanis Club, National Business Leaders Association, Canadian Club of Chicago and the Cuban Club of Chicago.

Accomplishments of the Society . . .

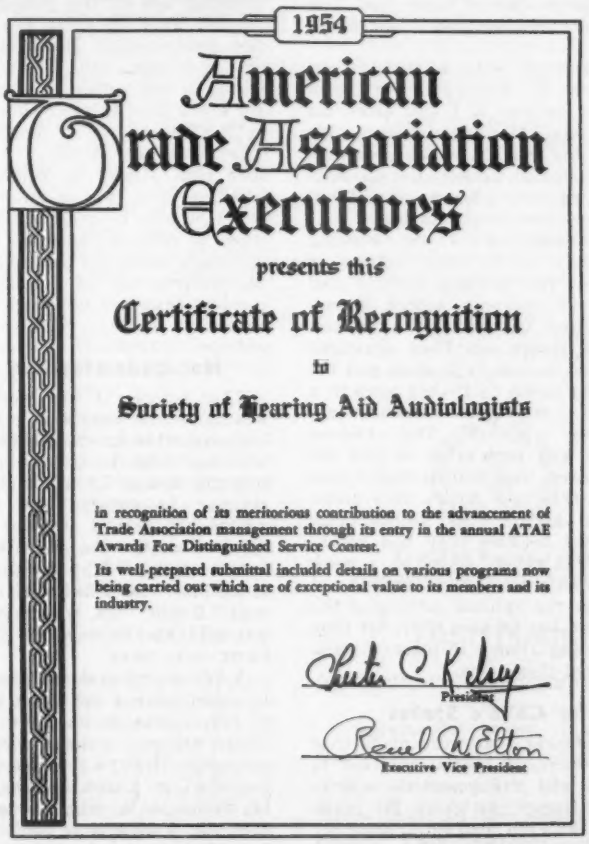
during Mr. Coil's term as Executive Director, are in part as follows:

- Approximately 600 individuals and firms have been certified in 46 of the 48 states.
- Establishment of minimum standards of performance for certification.
- A National Board of Examiners has been established and is functioning.
- A National Board for Certification has been set up and is in operation.
- Annual academy meetings have been established, where scientific lecture series have been presented by teachers from the fields of Medicine, Audiology, Physics, Psychology and Industry.
- An official journal has been created and is now published bi-monthly, completing its third volume, with a sworn circulation in excess of 15,000 copies.
- Personal instruction courses have been set up and attended with satisfactory results.
- A correspondence course of instruction is now in course of being prepared.
- A Grievance Committee has been functioning in a satisfactory manner with a minimum of complaints.
- Establishment of committee on instruction to prepare correspondence course, etc.
- Through the pages of AUDECIBEL it is maintaining contact with and giving information about its members to more than 7,000 otologists and others in the fields of medicine and audiology.
- The hard of hearing public has profited directly and indirectly by having better service available to them and a means of identifying those certified as being competent, reliable and responsible.
- Manufacturers have profited by having better distribution through better distributors.
- Members have profited by doing more business as a result of acquiring professional status in their community and the goodwill and respect of the medical profession.

The President Comments

In his letter of November 5th to the Society's Board of Governors, announcing the resignation of Mr. Coil, Mr. Thornton Zanolli, President of the Society, said in part as follows:

"I cannot adequately express our deep and lasting appreciation of all that Grover has done, the thought, worry, and very real personal sacrifices—many of which we are not even aware of, I am sure—that have been responsible in so large measure for the success and growth of the society, and this dates from the days before the inception of the society itself. We owe him a debt of gratitude which is impossible to assess at this time, not to say put into words. Personally, I can say very sincerely that my job for the society would have been utterly impossible without the complete cooperation and help I have had from Grover. Furthermore, knowing how sincere Grover's feelings are about the society, his resignation is somewhat softened for me by the certain knowledge that we will be able to count on him for help and advice, and call upon his experience, which is unique among us and invaluable, whenever we have the need."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American Trade Association Executives
presents this
Certificate of Recognition
to
Society of Hearing Aid Audiologists
in recognition of its meritorious contribution to the advancement of Trade Association management through its entry in the annual ATAE Awards For Distinguished Service Contest.
Its well-prepared submittal included details on various programs now being carried out which are of exceptional value to its members and its industry.
President
Executive Vice President

The signal honor which was accorded S.H.A.A. by the American Trade Association Executives distinguished jury has been authenticated by a handsome parchment scroll, reproduced here, which has been framed and is hanging at the Society's headquarters. In their letter of transmission, A.T.A.E. said, in part: "The value of your entry did not end with its recognition by our Jury of Awards. All copies of the entries will be distributed to Schools of Business Administration and Public Libraries where they will serve a very useful purpose in improving the public relations of trade associations."

Never Underestimate The Power of An Idea

By ***Beatrice Jacoby, Ph.D.***

Department of Speech
Queens College, Flushing, N. Y.

SOME ideas are helpful to communication and some ideas are barriers to communication.

Since we are all agreed that communication is what we want more of, let's focus our attention on the ideas that are obstacles and on those that promote understanding. Let's talk about talking.

May I start with a story about Jimmy who is 7 years old. I've known him since he was 3. I also know his parents and his grandparents, his brother, his neighbors, his teachers, the local station master, the automobile repairman and hordes of children of all ages who play with him.

Three weeks ago, I was working with Jimmy on the lawn in front of his house. Ten minutes after I had started our morning speech lesson, five children of assorted sizes and ages had joined us. They arranged themselves in orderly fashion and behaved very much as if they were in a classroom. Jimmy greeted each arrival with great approval. The children competed with each other to give the right answer, they waited their turns to speak, they told stories, they asked questions—all in all they seemed quite happy. Not because they had voluntarily begun school activities a week earlier than their classmates and not because of the unusual setting of the classroom—but because they felt they were helping Jimmy to learn to talk. And indeed they were.

The Child's Status

Two remarks that were made that morning were of special interest to me. Alan who is 8 years old said to Robert, "Jimmy can read. He reads good. He can even read better than my brother." His brother is 9 years old. The remark happened to be true. Alan's brother is a bit behind in his reading and Jimmy is about a year ahead in his. I decided to push the idea in order to give Jimmy the kind of status he deserves in the group. Children like him. They play with him. They frequently follow his leadership. He's charming and aggressive and it's hard to withstand his blandishments. But the children don't talk to him very much. They evidently think he's not bright. Since he's probably of superior intelligence he doesn't get fair treament. Later on in the morning one of the youngsters was playing with the extra hearing aid I had demonstrated. He asked to try it on, and then said, "When Jimmy learns to talk better he'll be all right. He won't have to wear this then, will he?" "Yes, he will, Johnny," I said, "He can't hear without it. But be sure that Jimmy is looking at you whenever you talk to him or else he won't be able to understand you, and when he talks to you make him speak as clearly as he did this morning." As the children ran off, I thought of an incident that had occurred two years before.

Non-Understanding Pity

That summer I was working with Jimmy in the basement playroom of his house when an automobile mechanic who had come to fix my car walked into the house. In a jovial, friendly manner he greeted me and said, "Whatcha doin'? Playing school?" "No," I said, "I'm teaching Jimmy how to talk." "Why do you need to teach him?" he asked. "He can't hear well," I said. "Oh, what a pity!" the guy said. And he looked as if he would burst into tears.

A 200 pound man who looked as if he could move a mountain was about to cry. I was in no mood for that. "Why are you sorry for Jimmy?" I snapped. "He's a happy intelligent boy who'll go places. He'll be whatever he wants to be when he grows up. His only trouble is he can't hear. But he can understand anything you say to him. He's learning to talk. He even knows how to read, and he's only 5 years old. Don't feel sorry for him." At which point I turned to Jimmy and said, "Would you like to read a story?" Jimmy took one look at his new captive and started to read aloud the story on the wall. The expression on the mechanic's face was ample reward for Jimmy. The truth of the matter is that he could have had anything he wanted from that man because he was sorry for him.

Just one more incident about Jimmy. I had not seen him for about two months. When I visited him in the middle of August his parents told me he had changed a great deal. A neighbor who was present said he had learned a lot of new expressions. And in a moment I heard all three of them. Someone asked Jimmy a question. He refused to pay any attention to the speaker. He closed his eyes and looked bored. His father insisted that he pay attention to the speaker. So Jimmy said, "That's just too bad. Don't bother me. I don't care." He kept on repeating the phrases like a broken record. The neighbor turned and said, "Isn't he cute? And it's so clear."

Yes, it was clear. And, no, it wasn't cute. It was rude behavior. And any child without a hearing loss would have been spanked for such remarks. But Jimmy was rewarded by the neighbor's smile.

Artificial Barriers

Now, what does all this have to do with speech development and barriers to communication?

The children who think Jimmy is stupid, the automobile mechanic who is overwhelmed by pity, and the neighbor who finds him cute, are all erecting barriers that interfere with communication. What kind of response can you expect if you call a person a dummy? a punch in the nose, perhaps, or a statement to the effect that he's not a dummy. But, you say nobody comes right out with the words, "You're a dummy." Of course not. We're all too polite for that. We just act as if he's stupid. For example, we might use very simple sentences of one or two words—at the most, three. We would speak very slowly the way we do to babies and foreigners who don't understand English. We would

gesture a great deal and perhaps draw pictures. On the whole, we'd stick to concrete ideas. And what is the result? Speech responses that are on the same level. "Jimmy go pool?" "Pool" says Jimmy, tugging at your arm.

In other words, the wrong signals were sent out. They were inappropriate to the occasion. Nevertheless they were received by the person for whom they were intended. The response, although inadequate for the occasion, was correct in answer to the signals. Adequate speech depends upon adequate stimuli. And the stimuli comprehend more than acoustic patterns that reach the brain via the ear and the hearing aid. You must start with an appropriate idea—one that suits the occasion, the purpose and the listener. That means that we ought to talk to Jimmy using the vocabulary and grammatical constructions that we normally use for 7 year old boys who are of average intelligence, average height and weight and have an average amount of physical energy. Isn't that how we talk to all hearing children?

Now what was wrong with the mechanic's attitude? He was sympathetic. All he really said was "Tsk. Tsk." Is that a good opening gambit in a conversation with a 5 year old? Or with anybody for that matter? What do you say when somebody says "Tsk. Tsk." to you? Furthermore that kind of speech doesn't provide a very good model for future linguistic behavior. Its only influence can be to make Jimmy feel sorry for himself. And surely such an attitude on his part isn't going to help him to talk to people. Nor is it a healthy attitude in itself.

The neighbor's attitude is not a wholesome one either. It supports rudeness which is scarcely a way to win friends or influence people and it helps to reinforce speech behavior which is bizarre—in this instance. Let us consider how Jimmy learned these three phrases. I can assure you I played no part in teaching them to him. Do you think he created them out of his own head without having imitated someone? Do you think he picked them up the way other children learn things they're not supposed to hear? Do you think he learned them as a result of wearing a hearing aid? No. Was he taught these phrases? Were they repeated incessantly? Were they drummed into his head? Yes. Who was his teacher? Quite a number of people who have to live with him. His father, for example, was one of them.

Jimmy's wishes are quite vigorous. For a number of years he used to throw a temper tantrum if he didn't get what he wanted. Was he frustrated because of our lack of understanding? No. He was frustrated because of our refusal to cooperate. After supper Jimmy might decide he would like to go for a ride. It mattered not that he'd been in the car all day or that his parents were tired or that it was time for him to go to sleep—all of which had been explained to him. He would keep on saying "car" and "ride."

Finally he would begin to tug and yell and bite and kick. As he grew older he discarded the tantrums but found other methods of persisting in getting what he wanted. When he asked for something his father would say "Don't bother me, now." Jimmy would continue to pommel him. So he would repeat in a loud clear voice, "Don't bother me." At which point Jimmy would attempt to do something that he knew was taboo—like scratching the dining room table. His father's response would then be "I don't care." Jimmy's final attack, which would start with "I want paper money," would bring the reply "That's just too bad."

Now, remember, that Jimmy's cravings are insatiable. They are Gargantuan. So he is likely to have elicited the above-mentioned responses fairly frequently during the course of an evening. His father's conversations might be repeated as often as 25 times. Multiply that by 7, and a little extra for Saturday and Sunday, and then multiply the total by 52. I don't know the exact number but it runs close to a thousand. Then remember that his mother gets into the act occasionally and so does his brother. Now, isn't it easy to understand why Jimmy learned to say "Don't bother me" without my help? And why he may not know the word "Splendid" or "may." Nobody says "splendid" 25 times a day so he can hear the word and associate it with a meaningful situation.

Jimmy's stock phrases which are articulated with clarity and excellent rhythm aren't going to promote very much conversation.

What will be the effect of this other idea which the neighbor lives by—that a child with a hearing loss will be unable to meet our standards of behavior—moral, emotional or physical? He will not meet them. If you expect a child to be unstable and you relate to him as if he were, in all likelihood he will behave in the expected fashion. If you expect him to be fresh you can easily provoke him to be so.

One idea which a great many people have, but surely no hearing aid specialist has, is that a hearing aid is all that Jimmy needs to speak clearly and be understood. The truth is that Jimmy has a profound hearing loss. He can hear sounds through his aid. He can even interpret words and sentences through his hearing aid with his eyes closed. But to do this with any degree of accuracy we must restrict the possible number of choices. As for speaking as he hears—he may well do that—but the result is not comprehensible to us.

(To be concluded in Feb. issue)

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"This I Believe"

Dr. S. R. Silverman

We are privileged to publish herewith the inspiring interview given by S. R. Silverman, Ph.D., Director of the Central Institute for the Deaf in St. Louis, as an outstanding contribution to the "This I Believe" series conducted by Edward R. Murrow. Dr. Silverman said:

It is my stimulating and pleasant privilege daily to observe a small deaf or speech handicapped child literally on the knee of his teacher who skillfully, patiently, hopefully and, I daresay, miraculously breathes into him that uniquely human skill—taken for granted by most of us—communication by speech. Down the corridor a bit I chat with the scientist who by his "industrious observations and grounded conclusions" probes for understanding of the processes of speech and hearing. And I contemplate the magnificent structure that accommodates these activities—built by voluntary contributions from many people of many backgrounds.

Then I realize the richness of my "routine" experiences and their significance in nurturing my beliefs and shoring them up during those occasional inevitable moments when our only arms against the sea of trouble may well be a feeble "What's the use?"

It is strengthening to be guided by the belief that people—all people, including the small deaf child—are important; that their aspirations, their purposes, their skills and, yes, their limitations are appreciated and understood and that it is possible for humankind to be concerned about them.

And when I see the deaf child "hear" with his eyes through lip reading, the victim of cancer deprived of his larynx learn to talk again, the scientist ingeniously explore the microscopic structures of the inner ear, how can I help but believe in the great potentialities of man. True, these have been enunciated and demonstrated through the ages by the discerning Greeks, by the Biblical prophets, by the prodigious artists of the Renaissance and in all places and in all times when man has had an opportunity to express himself. But my beliefs have had to come through my own experiences and introspections.

Along with my conviction that it is possible for man to get concerned about man and along with my faith in his potentialities, I believe with Lessing, that the pursuit of truth is as important as its attainment. Man's progress toward betterment is not inevitable but it is more likely to come about in an atmosphere of reason, buttressed, as I have implied previously by morality and hopefulness.

My professional career, then, has brought into steady focus what I suppose I have been maturing toward from childhood through the storm and stress of my undergraduate days which, incidentally, straddled boom and depression from 1929 to 1933.

I guess the "short title" for what I believe and how I got there was expressed for me in the comment of a Rabbi who visited our Institute when he said, "Ears have they not but they hear, thanks to wisdom and love."

CC Help, Inc., 1954

This statement was prepared for Edward R. Murrow's program "This I Believe," a series of five-minute broadcasts, on which men and women in all walks of life present their personal philosophies. Launched in 1949 by four businessmen who were concerned over the decline of spiritual values, "This I Believe" is run without profit, depending upon anonymous contributions, and is broadcast over 200 U.S. stations, 140 foreign stations, and the Voice of America in six languages. It appears weekly in 90 newspapers. In book form, "This I Believe" is a best-seller in the United States and was also published in Great Britain and in Arabic.

Advice of Counsel

by
Felix Visk

Most of us file returns jointly with our wives and thus save money because in effect the larger of the two incomes is shared with the smaller income for tax purposes. Heretofore if one spouse died, the widow or widower could not benefit from such income sharing after the year in which the death occurred. Under the new law, a widow or widower may continue to split—or share—his or her income for two years after the year in which the death of a spouse occurred if the surviving spouse has not remarried and maintains as his home a household which is the principal place of abode of a child or stepchild who is a dependent.

Are you retired or about to retire? If so, you will be interested in Section 37 of the Code. In brief this provides that if you are 65 or over you may receive credit on income derived from pensions and annunities, interest, rents and dividends equal to 20% of the 1st $1200 of such income, provided you had earned income in excess of $600 in each of the 10 previous calendar years. Such credit is limited to $240 and may not exceed the tax otherwise due.

If you are under 65 and retired you may take credit only for income received from pensions, annuities or similar retirement pay from public retirement systems.

In any case the amount of retirement income is reduced by amounts received from social security or the railroad retirement system or otherwise exempted from gross income plus, in the case of persons under 75 years old, any amount of earned income over $900.

You are 65 and have earned over $600 a year since 1944 and have
rents & interest of $500 per year.
pension of $1.000 per year.
Total "retirement pay" $1500 per year. Total retirement pay on which credit is allowed is $1200. You receive $500 in social security benefits. You earn $1400 or $900 plus $500. Amount deducted from total retirement pay on which credit is allowed—$500 plus $500 or $1000. Amount of retirement pay available for credit $200. Credit against tax—20% of $200 or $40.

(Continued in Next Issue)

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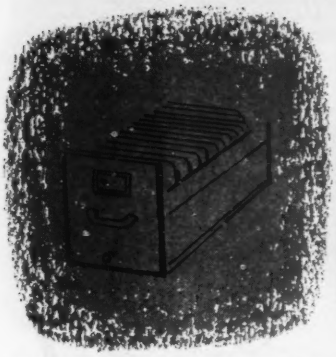

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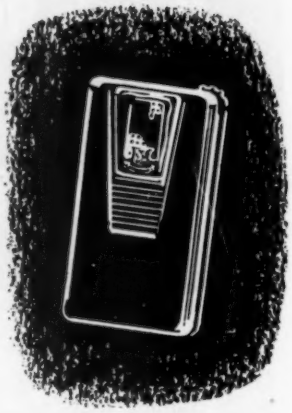

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Hearing Aid Design

for Selective Fitting

by *Harvey Fletcher, Ph.D.*

Director of Research
Brigham Young University, Provo, Utah

I have spent this morning by trying to find out what this Society is doing. I wandered through the exhibit room. As I wandered through the exhibits I was impressed by the tremendous progress that has been made in the quality of hearing aids since I first tried designing one at the Bell Telephone Laboratories.

I remember the first one which we built worked very well, but it took three large book cabinets to house it. Ever since then the compromise between looks and size, the battery drain, etc., as against the performance of the set has been going on.

I picked up your magazine, AUDECIBEL, which reminded me of the difficulty we had trying to change the name "sensation units" to the name "decibel."

I went to Europe on a commission from the United States to try to persuade everybody to adopt the word "decibel" for telephone use. After the "decibel" was adopted for telephone use I had the problem of converting the otologists to use "decibel" instead of "sensation units." It was difficult since I had originally introduced the "sensation units" to them, and it took about 25 or 30 years to do it. It is only very occasionally that you now see "sensation units" in print.

Well, those were some of my thoughts as I came to your meeting today.

Philosophy

The subject that was announced was not selected by me. I was asked to speak about it, and it is obvious from the way it is phrased that one expected it to be a controversial subject. It implies that the Harvard group believes one thing and that I believe another about the philosophy of fitting hearing aids.

I think the difference in our views is not that simple. I wouldn't say that the Harvard group were wrong, because I am in agreement with most of the conclusions in their report. I think if you will look carefully you will find my name in the final report, although I wasn't immediately concerned with it at the time; I was Chairman of a committee that had supervision or general charge of it.

I want you to know that I think the work was very well done. It is undoubtedly the best work of that sort in this field that has been done. It is the only extensive quantitative articulation work that has been done on hard of hearing patients.

There has been a lot of work by cut and try methods, which are rigorous for determining how well persons can hear with various devices, but I think the Harvard work stands as the best that has been done. Nevertheless, the observational error involved is very large, and for this reason several different theories may be justified by this same set of data within the observational error. That is where the difficulty lies, and why there is a controversy.

Opinions

If there was a clear-cut case, and the objective data showed what it was, you would not have asked me to speak today. There is still a difference of opinion among the sellers of hearing aids, and for the same reasons that were encountered by the Harvard group. They can't make definitive and objective experiments to differentiate between some of these different points of view.

Well, when you are faced with such a dilemma, what are you going to do about it? Each of you can go along with your own pet ideas and sell hearing aids and tell the patient that the other fellow is all wrong, and you are right, and that is probably what has been going on. There is no data sufficiently precise to determine which is right or wrong.

Since one can't make a definite differentiation between these various points of view by objective data that all agree is good data, one must reach conclusions by other means. What I have done is to rely not only upon this Harvard data, but upon a vast amount of data on persons with normal hearing; and also upon our fundamental knowledge of how the ear works. All of these items should be combined to make the whole picture. When this is done I come out with a philosophy and method of determining what kind of a hearing aid is best for a particular hearing characteristic. The application of this method to the cases in the Harvard report agrees with the experimental data within the observational error.

However, the method differs from the conclusions that have been publicized from the various people talking about the Harvard report, including some of the members of the supervision committee. If you make a careful reading of that report, it will not give you the conclusion which is now announced in the title of this paper that all you need is one hearing aid with a certain characteristic.

If you read that report carefully you will find it does not say that. These ideas have come from propaganda and popularization of someone's ideas about the report rather than the actual conclusions in it.

What I want to do, then, is to try to put into simple terms a theory I have evolved as indicated above about how a person with a given type of hearing, and a given kind of intellect, hears sounds with a given type of hearing aid.

Now that is a pretty big order, but I will try to isolate the factors so that you may see, in general, what they are and how they enter into the problem. Also, I will give them names and represent them by symbol. The first one is called Articulation Index, and is represented by the letter A. I will not try to define it technically but simply say that the Articulating Index is related to the ability of a listener to interpret properly speech sounds which he hears, whether they be in the form of sentences, words or

(Continued on next page)

Hearing Aid Design for Selective Fitting

. . . continuing from page 11 the article by Dr. Harvey Fletcher

syllables. In other words, it is an index number which indicates how well the deafened person will speak when he is wearing a certain kind of hearing aid and listening to a certain type of talker at a specified distance from the ears of the listener.

So A depends upon the characteristics of the listener, the characteristics of the talker and the characteristics of the hearing aid and how far it is away from the lips of the talker.

There are four factors that determine the articulation index. First, there is a factor designated V, then one designated E, and one designated F, and finally one designated P. When values of these four factors are determined they are multiplied together to determine A, the articulation index.

Contributing Factors

Now, what are these factors? The V factor is determined by how far the speech level is above the threshold of hearing for the patient. If the speech is not loud enough so that he can hear it at all, then this factor is zero and so A will be zero regardless of the value of the other factors. So we say the first factor depends upon how loud the speech sounds to the patient. Specifically it depends upon the number of decibels that the average speech level is above the threshold. So one of the primary things to remember is to raise the speech level enough so that it is far enough above the threshold of hearing for the patient so that he will hear the loud and soft speech sounds in their proper relative levels.

Now one can't always do this. If one could, one would restore the person's hearing practically to normal. There are some cases, rather a large number, in fact, which are in this category. But the remaining cases, particularly the very hard of hearing cases, you never can do this because of this second factor which prevents one from amplifying beyond a certain critical level.

The second factor depends upon the intensity of the sound hitting the ear. In general, this factor E is the same for a hard of hearing person as it is for a deafened person. Consequently one must get the speech level sufficiently above the threshold without reaching the level where it hurts. This then is your critical problem. In very severe cases the ear will be hurt before the speech level is high enough to portray the soft and loud sounds, and the variation between them in the correct relation.

The numerical value of the E factor is unity as long as the sound does not approach the level where it hurts. When it gets to this level, the E factors get less and less until the patient will no longer stand any louder speech, and so take off the set and E goes to zero. Therefore, the V and E are opposing factors. The E goes down in value as the intensity of speech goes up, but the V factor always goes up toward units as one goes to higher levels, reaching unity when the level is about 60 db above the threshold.

Then we have the F factor. The F factor is dependent upon the shape of the response curve, and it is this factor about which so much controversy has arisen. What should be the shape of the responsive curve of the hearing aid compared with the shape of the audiogram? In other words, having made an audiogram of the patient, what can you do in the way of shaping the response curve of the hearing aid to obtain a greater A?

Now actually the best response gives a value F equal to unity. As you depart from this ideal response, this factor becomes less and less. This factor F is called the frequency distortion factor, and it depends upon the response of the set at the different frequencies and the shape of the audiogram. I will go into this relationship in a little more detail later.

Then you have the fourth factor, P. When I tell you what it is, you may say, "Well, so long as you have that factor, you can make it absorb all of the troubles that you miss in the others," because it is the psychological factor called the practice factor. It determines how well the person would understand if he had an ideal set, that is, if the other three factors were unity then this fourth factor determines how well the listener understands the speaker.

To illustrate what I mean, if you have a hearing aid on a patient with moderate hearing loss, and you have him fitted perfectly, and then talk to him in English he won't understand much of the speech if he only understands French.

Now there are a lot of hard of hearing people that do not understand English, that is, do not understand it very well. As you know, those who have been hard of hearing for a long time, and consequently have little chance to hear speech, will have difficulty understanding speech even with the most ideal set.

So the practice factor P is the amount that the articulation index would be if one used an ideal set. Now you wonder what I mean by "ideal set." In the case of a normal hearing person, the ideal set is the air path between a talker and a listener of about two feet. If the talker is talking in a normal conversational tone of voice, then the listener will get the maximum interpretation under these circumstances. If he moves farther away, the interpretation will drop. If he gets closer, it will also drop slightly.

Now having understood these four factors, let me say just a word more about this P factor. Taking the illustration of the Frenchman, he can learn English if you teach him. In like manner by continuing use of a hearing aid under proper circumstances with a good speech teacher, one can bring up the factor P from a very low value to a fairly reasonable one. So there is considerable virtue, as you all know, in teaching a person how to use the hearing aid by intelligent methods. A complete exposition of these methods would require another paper or probably a book.

This training to better understand speech simply raises the P factor. It is probably because of this P factor which varies from individual to individual that the other factors are obscured. In other words, a patient may wear a bad hearing aid, and because of his fine high P factor get much better results than another patient wearing a very good hearing aid G, but having a low P factor.

Knowing these results one is tempted in sales work to use them and say, "With this hearing aid, B, this patient heard better than the other patient with hearing aid G," and so on. It is this that has led into much of the difficulty; namely, the masking of the relative values of sets because of the great variation in the individuals who use them.

Now let us discuss in a little more definite way, the values of the other factors. In the first design of hearing aids, very little attention was paid to anything except the V factor. In other words, the aim was to make the speech loud enough and the patient could then hear. This was the right point of view at the time. Unfortunately, as time went on, we lost sight of that fundamental proposition and put most of the attention on the shape of the response of the set.

Determining Factors

Now we will look again at the four factors that determine the Articulation Index A; namely, the volume factor V, the ear desensitizing factor E, the frequency distortion factor F, and the practice factor P. The Articulation Index is given by the product of these four factors, or A=V.E.F.P.

In figure 1 are shown curves indicating how the V and E factors are related to the average intensity level of speech at the ear. For example, for a listener of normal hearing, when the speech level is 12 db, he will just perceive that speech sounds are present. As the level is increased from there to a level of 80 db the speech sounds increase from 0 to maximum. As the level goes above 80 db the speech sounds are too loud and his ability to interpret them decreases. The amount of this decrease is de-

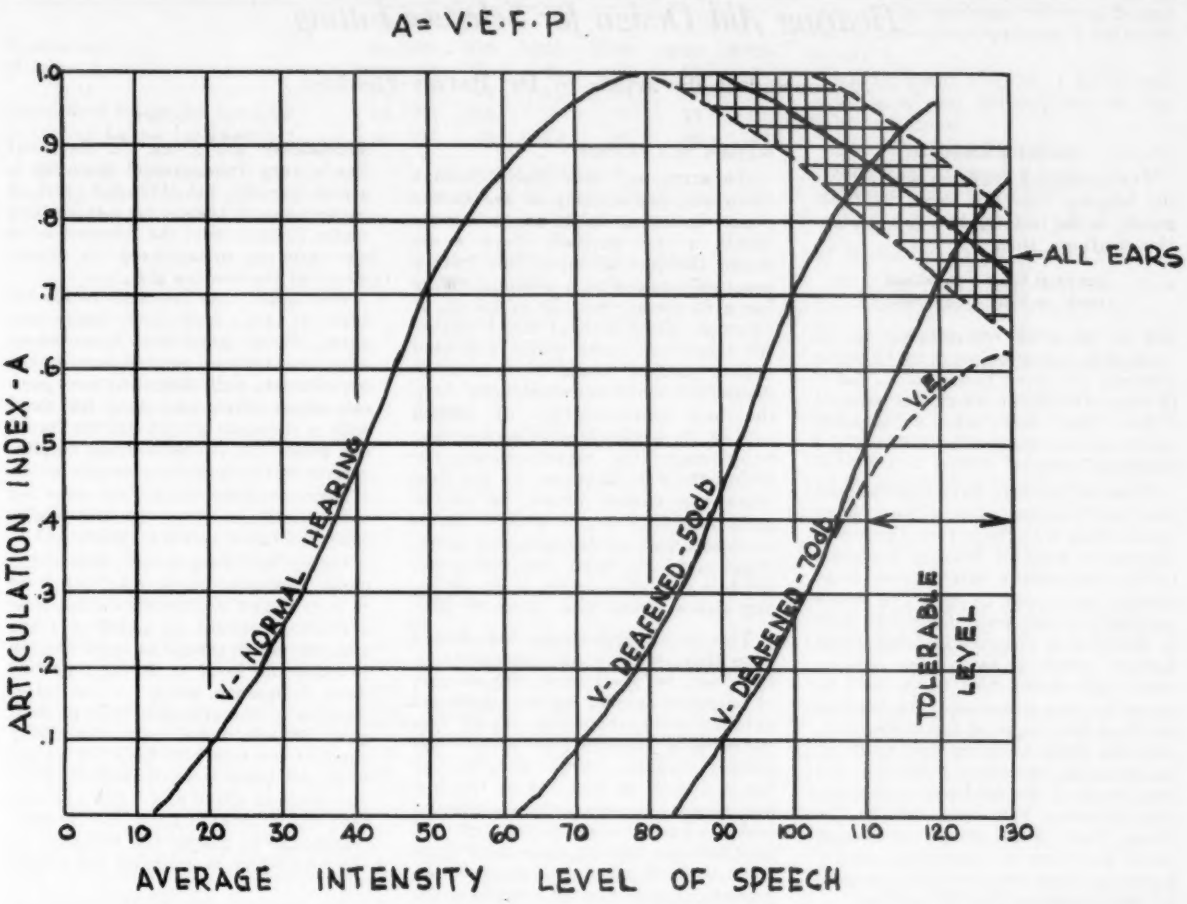

FIG. 1

pendent upon the tolerance of the individual for these loud sounds. This tolerable level is about the same for normal ears as for deafened ears, and varies around the average of 120 db. It may be 10 db lower or 10 db higher than this level. Some deafened ears, called tough ears, can take a level of about 130 db or higher without discomfort.

The factor V is shown by the curve in Figure 1 at the left labeled normal hearing. After reaching 80 db it remains unity for all higher levels. The factor E is shown by the cross-hatched portion for all listeners. It is seen that from about 75 db to 95 db both V and E are unity for a listener of normal hearing. This corresponds to the condition of a talker talking in a conversational tone at about 2 feet distance from the ear. The V factor curve for the deafened ear is moved to the right by the number of db corresponding to the average hearing loss for speech. For example, the second curve from the left is for a deafened person having a hearing loss of 50 db. As the level is increased above 62 db such a person will interpret more and more of the sounds without discomfort until he reaches about 120 db. In other words, with a hearing aid which will amplify 60 db his hearing can be restored to approximately normal at least as far as the two factors E and V are concerned. However, for higher hearing losses this is never so. For example, consider the third curve from the left for a deafened person having a hearing loss of 70 db. The product of the factor $V \times E$ is shown by the dotted curve. The articulation index never goes above .6. If the deafened person's ear is a tender one then the maximum articulation index is considerably below this. So it is seen for these very hard of hearing persons it is very important to know the tolerable level and if possible treat him so that this might be increased to a maximum. For it is evident that for these cases the speech level cannot be much above the threshold value before it gets to the tolerable level. The higher the level which they can take the greater will be their interpretation of the sounds. So I think you can all see that one of the important things to remember in changing the response of the hearing aid is to find how it will affect this tolerable level, either increasing it or decreasing it. Sometimes this effect is very much greater than the departure of the response curve from the flat response, and remember the V curve is steep in this region. So just a small increase in the level of the speech produces a large effect upon the ability of the patient to understand it. This must be kept in mind when any changes in the response curve are made which might affect the tolerable level, so from the standpoint of the V factor the shape of the response curve is chosen for very hard of hearing cases so that a maximum loudness of the speech sounds can be tolerated.

The F factor for a listener having normal hearing will be unity when the response curve is flat. Any departures from flatness will reduce the F factor, below unity. For conductive deafness the hearing may be considered to be the same as attenuations introduced into the response of the hearing aid. Consequently if h is the hearing loss in db, and r is the response of the hearing aid, then the response that makes F equal to unity is given by

$$r = h + \text{constant}$$

For nerve deafness the consideration is much more involved, but as a good working rule the response that makes F a maximum is given approximately by

Hearing Aid Design for Selective Fitting

... concluding the article by Dr. Harvey Fletcher

$$r = \tfrac{1}{3}h + \text{constant}$$

For combined deafness where h_n is the hearing loss for nerve deafness and h_c is the hearing loss for conductive deafness, then

$$r = h^c + \tfrac{1}{3}h^n + \text{constant}$$
$$r = h + \tfrac{1}{3}h + \text{constant}$$

But it must be remembered in all cases that compromises must be made between the three factor V, E, and F so as to obtain the maximum product V.E.F. One may take a response which gives a lower F in order to get a higher V, etc.

Some of you may have tried to read the last chapter in my new book which deals with these four factors as applied to hard of hearing listeners, but to understand this chapter completely one needs to read the whole book as you may have difficulties with it. But it does describe in detail these factors which I have been talking about and shows how to proceed to get at the best response of the hearing aid from the shape of the audiogram, and also from knowing how much of the deafness is nereve deafness, and how much of the deafness is obstructive deafness. You know how to fnd these from your bone conduction curve and your air conduction curve. Knowing these two, one can prescribe an ideal response for the patient.

About 30 years ago I gave a paper when the hearing aid business was in its infancy in which I stated that from all the data available at that time on normal ears and on a few hard deafened ears, one concluded that the best response curve for a hearing aid was a mirror image of the audiogram curve. You are familiar with that point of view.

After 30 years of study, I still say that is true of obstructive deafness cases. However, the point that was missed through the years is the fact that you can depart by large numbers of decibels from this ideal curve and it makes very little difference in the ability of the patient to hear well.

In other words you can say, for example, that if the audiogram is flat, you ought to have a flat response curve. However, the actual response curve may vary 10 db on either side of this flat curve so that the peaks and valleys are 20 decibels apart, and still the patient would hear almost as well as with a flat response curve. One can calculate the difference, but the calculations show it to be so small that one can not measure it experimentally with any of the techniques we now know.

For practical purposes one must realize that making a variation of 10 or 15 or 20 decibels as you go through the frequency range is hardly detectible to a listener.

An error has been made through the years, particularly in the earlier years, in trying to fit an audiogram within a few decibels. Such a set would function all right, but from a practical standpoint it is foolish to try for a fit closer than 10 or 15 db. A rigorous calculation of the F factor for these two cases would indicated that a patient would be unable to distinguish which set would give them the best interpretation of speech sounds. So a considerable leeway may be given to the manufacturers for fitting these audiograms. In the first place one cannot obtain an audiogram and duplicate it without variations of about 10 decibels, and sometimes more. So from just that point alone it is foolish to try to fit within any closer limits than 10 to 20 db's.

This is an important item and I hope that you now all understand it. However, before I leave this subject of response curves, let me emphasize another point about the cut-off frequencies at the two ends of the frequency response curve. Assume one has a cut-off at 300 cps at the low end where the curve drops abruptly, and one has a cut-off at the high end at 3,000 cps. Raising the cut-off from 3,000 to 3,500 cps is a very real improvement and can be definitely detected experimentally. It will be found that increasing the cut-off 3,000 to 3,500 or to 4,000 cps will give you much greater improvement than trying to make the response curve flat. Even though you have undulations of 20 decibels, it will not do as much harm as the elimination of these frequencies from three to four thousand cps.

The same thing is true on the lower frequency side. Changes in the cut-off here, however, affect the quality of the voice rather than the articulation. If one does not care anything about the quality, but only about the ability to understand speech, then one can raise the cut-off frequency to as high as 400 cycles.

To illustrate how one would find the ideal response for the hearing to be used by a particular patient, consider the specific case. In table 1 below are given the fundamental data to be used in finding the proper response. In the first line the six frequencies used in audiometry are given. In the next line a very fundamental quantity is given, namely, the intensity level of conversational speech for a talker one meter distant from the listener, or in our case one meter from the microphone of the hearing aid.

One line 3, the tolerable levels for each of the frequency bands are given. These have been determined experimentally on normal ears. Other experiments with deafened ears indicate these levels also hold for them with a variation of ±5 db. On line 5 are given the corresponding amplifications to reach these tolerable levels.

Now consider a typical case of nerve deafness given by the audiogram indicated below in Table 2.

Using the rule given above for nerve deafness cases, the value of ⅓ h is shown on the third line. Now a constant should be added to these numbers which should be large enough to raise the level in at least one of these frequency bands to the tolerable limit. The constant then is obviously 56 which will raise the 2,000 band to the tolerable level of 78 db. With this same constant amplification the bands at 4,000 and 8,000 are also near the tolerable limit. So it looks reasonable to choose the response as $\frac{1}{3}h + 56$ which is given on the fourth line.

Let us examine further this response. With it, what will be the level of speech above the threshold level, that is, the sensation level of the speech in each band for this particular patient. It is found by subtracting the hearing loss from the sensation level of speech for a normal ear, that is, from the numbers in line 5 of Table 1. This gives the following sensation levels:

83 88 82 66 46 27

which are seen to be adequate. For this case probably 20 db lower amplification would still be adequate for the case considered, namely, a talker one meter away from the microphone. Distance larger than one meter should be treated as attenuations: 2 meters 6 db; 4 meters, 12 db; 8 meters, 16 db; 10 meters, 20 db. So the relative response of the set for this patient should be

0 4 9 16 21 25

with the possibility of additional overall amplification of from 40 to 50 db.

TABLE 1

Frequency	= 250	500	1000	2000	4000	8000	cps
Speech Level in Octave Bands	= 60	65	64	56	47	40	
Tolerable Levels	= 128	130	126	123	119	119	db
Amplification to Reach Tolerable Level	= 68	65	62	67	72	79	db
Sensation Level of Speech for Average Normal Ear	= 38	51	57	54	45	32	

TABLE 2

Frequency =	250	500	1000	2000	4000	8000
Hearing Loss h =	17	29	46	66	82	92
⅓ h =	6	10	15	22	27	31
Prescribed Response ⅓h+56 =	62	66	71	78	83	87
Sensation Levels for Speech =	83	88	82	66	46	27

Now take another case of conductive deafness. The following is an actual case:

DR. FLETCHER: I never saw an audiogram like this where the diagnosis was perceptive deafness.

Frequency =	250	500	1000	2000	4000	8000
Hearing Loss h =	60	54	55	46	43	38

According to the rule above, the response r=h+constant. If the constant is taken zero then the response is equal to h. With this response no tolerable levels are reached and the sensation levels of the speech to this patient when using an aid having the above response characteristic will be the same as for a normal ear. So he would receive a complete restoration of his hearing ability. A flat response would work almost as well. Consider a severe nerve deafness case as a final example. The audiogram is

FROM THE FLOOR: If it is all perceptive, what do you do if you want to get the proper audiogram from the standpoint of the distortion factor?

DR. FLETCHER: Take ⅓ of

20 20 25 30 50 65

and it gives

7 7 8 10 17 22

or the relative response should be

0 0 1 3 10 15

You see that is almost flat. You would need almost a flat audiogram in this case. That would be your answer for your best response. Is that satisfactory? (Indicating) That shows you the method. Now that ⅓ rule does not hold exactly, but I found by actual practice it is a good start. If you wanted to get it exactly you would want to see what the effect would be on all of these factors, V.E. and F. In this case it would be useless work because you know you are going to come out with something that is nearly flat, so why go through it all? Does that satisfy you?

Frequency =	250	500	1000	2000	4000	8000
Hearing Loss h =	42	60	72	96	105	111
⅓ h =	14	20	24	32	35	37
Add Constant 40 =	54	60	64	72	75	77
Compromise to Get Greater Loudness =	+4	+2	−2	−5	−3	
Prescribed Response =	58	62	62	67	72	77
Prescribed Relative Response =	0	4	4	9	14	19

The last gives the prescribed response with provision for giving an additional over-all gain of 58 db. Under such circumstances the sensation level to the patient will be

54 53 49 25 12 8

These are somewhat low in the high frequency, but are the best that can be furnished without hurting the ear.

I think I have said everything that I intended to say, and probably more. If you have some questions, or would like to propose some audiograms for calculation, I will be glad to show you how to find the proper response.

FROM THE FLOOR: Yes, it does. Thank you.

(2nd) FROM THE FLOOR: Could I give you an audiogram I think would be more suitable for this. I had another audiogram I thought maybe would be more suitable. At 250 it is 70; 500, 70; 1,000, 70; 2,000, 90; 3,000, 70; and 4,000, 90. We are having quite a little difficulty with that case.

FROM THE FLOOR: I would like to give you a typical audiogram.

Frequency =	250	500	1000	2000	4000	8000
H.L. =	20	20	25	30	50	65

DR. FLETCHER: Well, I didn't say anything about determining when you need a hearing aid. Immediately when I see audiogram I conclude the patient does not need a hearing aid. The chances are he would be dissatisfied with any set because he can hear so well without it. But if you want me to say what the proper set should be, the answer is: he should wear no set.

I am talking about conversational speech. Of course, in church or in the theater, a hearing aid might be helpful. Is it obstructive deafness?

FROM THE FLOOR: No, it is primarily perceptive.

DR. FLETCHER: All perceptive?

FROM THE FLOOR: Yes.

DR. FLETCHER: What is 8,000?

FROM THE FLOOR: I haven't got that. It drops off pretty sharply there, I think probably to about 95.

DR. FLETCHER: Well, is it perceptive?

FROM THE FLOOR: Is the air conduction test the same as the bone? There is very little bone conduction possible, it is all air.

DR. FLETCHER: I heard what you said, but I am skeptical of having that much deafness without having partly perceptive deafness. I am sorry to say I—

FROM THE FLOOR: I am sorry I can't give you information on the bone test there.

DR. FLETCHER: First, let us assume it is perceptive deafness, then the relative response is

⅓ h =	23	23	23	30	23	30	32
1/ h−23 =	0	0	0	7	0	7	9

If it is conductive deafness, then the relative response is given by

h =	70	70	70	90	70	90	95
h−70 =	0	0	0	10	0	10	15

In either case the response is almost flat, so the F factor is nearly unity. Consequently the response should be determined solely by the tolerable limits consideration, and should be

68 65 62 67 72 79

or a relative response

6 3 0 5 10 17

with provision for an additional over-all gain of 62 db. The corresponding sensation levels are

36 46 49 31 21 16

It is seen that these sensation levels, even with the maximum gain possible, are still from 5 to 20 db lower than for a normal ear. However, under ideal conditions given above he should hear fairly well when he is properly trained so that the P factor becomes a reasonable size.

In this case it is very important that the set does not leave a peak in the response. Only a few db in the maximum gain that the patient can take will make a large difference in the understandability of the speech. The possible 10 or 20 db deviation that was tolerable from the correct response does not apply to this case, because it is not the F factor that will be affected, but the V factor.

FROM THE FLOOR: Thank you, Doctor.

DR. FLETCHER: Any others, just to get the general feeling of this? Maybe you can look these things up and become interested. You will find it works out pretty well.

FROM THE FLOOR: You might be hesitant to give us the information, but we are all interested, Doctor. What is the exact title and publisher of the book you referred to?

DR. FLETCHER: I'm glad to give it to you. It is D. Van Osterman & Co. It is entitled, "Speech and Hearing in Communication", the last chapter in the book deals with the subject. I say, if you want to be a student, you can read the whole book and then you can understand these things in detail and then you can apply them intelligently.

FROM THE FLOOR: Fletcher and Munson would be a good one, too.

DR. FLETCHER: Well, Fletcher and Munson haven't written a book.

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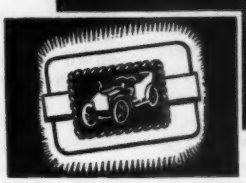

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Newsworthy!

Stanley K. Webster Laboratories Announce New "Astra" Model

Stanley K. Webster Laboratories announces its new "Astra" model, the first hearing aid in the Stanley Webster "Starline."

Webster states that this is also the first hearing aid to employ four transistors which obviates the use of a transformer, thereby accomplishing improved low frequency response.

Stanley K. Webster

He also states that the "Astra" hearing aid presents a brand new type of microphone which plugs into the transmitter. With the microphone plugged into the transmitter, the combination unit takes on the appearance of a miniature ornament, especially so because it may be worn as a dress clip, in the hair, as a wrist ornament, or on the coat lapel with the tiny microphone out in the open.

Webster further states the transmitter is 1⅜" high, 1⅛" wide by .350" in thickness. It is further stated that the circuit design of the new "Astra" unit is essentially different and employs negative feed-back to reduce distortion. The circuitry is also responsible for the marked improvement in frequency response and higher gain and power. Noteworthy features include the Raytheon No. 726 transistors hermetically sealed in a metal container. This transistor is said to be of the highest quality and it is used exclusively in the "Astra" hearing aid. Its extremely tiny size has contributed greatly to the miniature size of the unit.

The unit is practically unaffected by temperature and humidity to eliminate such interference with power gain. A separate tone control, separate volume control and separate On-Off switch permit excellent control to suit individual requirements of the wearer. The volume can be set at the desired stage where it remains constant while not in use, eliminating the need for resetting the volume each time it is worn. This is the first time such a small volume control has been employed, according to the manufacturer.

The designer of the new "Astra" unit in the Starline, Stanley K. Webster, is a former vice-president and director of research and engineering for two prominent hearing aid manufacturing firms. His experience in the electronics field has included a long tenure in government radar test equipment, four years at radar specialty work while in the service of the Navy. He has devoted considerable time to speech and advanced engineering courses at prominent universities, including a highly specialized course on transistors at Pennsylvania State College. He has been a member of the American Standards Association and has served on committees for speech audiometers and for standards of hearing and measurements. Mr. Webster has been a member of the Acoustical Society of America, the joint council of the American Medical Association and the Hearing Aid and Audiometer Manufacturers Association of America for several years, among his numerous affiliations.

Leading Authorities To Beltone Trustee Posts

Four leading authorities in the hearing field have accepted posts as governing trustees of the Beltone Institute for Hearing Research, Chicago, Sam Posen, Institute Chairman, announced today (Wednesday, Oct. 20).

Representing four areas of specialization, the new trustees are: Miss Katherine Barrett, director, Bureau of the Physically Handicapped, Chicago Board of Education; Dr. Raymond Carhart, head of the audiology department, Northwestern University; Dr. Howard C. Hardy, assistant manager, physics department, Armour Research Foundation; Dr. Heinrich G. Kobrak, director of otolaryngological research, Wayne University.

The Beltone Institute will sponsor and direct research on hearing problems covering such allied fields as medicine, sociology, psychology, and acoustics, Posen explained.

As its first project, the Institute is sponsoring the translation and publication of a series of foreign language documents on hearing that are not available in English. The project is under the direction of Dr. Charles Lightfoot of the Northwestern University audiology department.

Maico Follows Through

Mr. Charles Lowe, Maico distributor of Chicago, is shown here presenting to your Executive Director the Maico hearing aid selected by Miss Virginia Mathis as one of her awards when she was named "Miss Hearing Aid—1954," for Mr. Coil to deliver to the young lady.

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As of November 15, 1954

This is the only official list of firms and individuals authorized to exhibit the Seal of Excellence and/or the Certificate of Competence, Reliability and Responsibility issued by the National Board. . . . This list is correct bi-monthly. Physicians and others making hearing aid referrals are invited to use it with assurance. Specific inquiries concerning member facilities in your locality will be answered fully and promptly.

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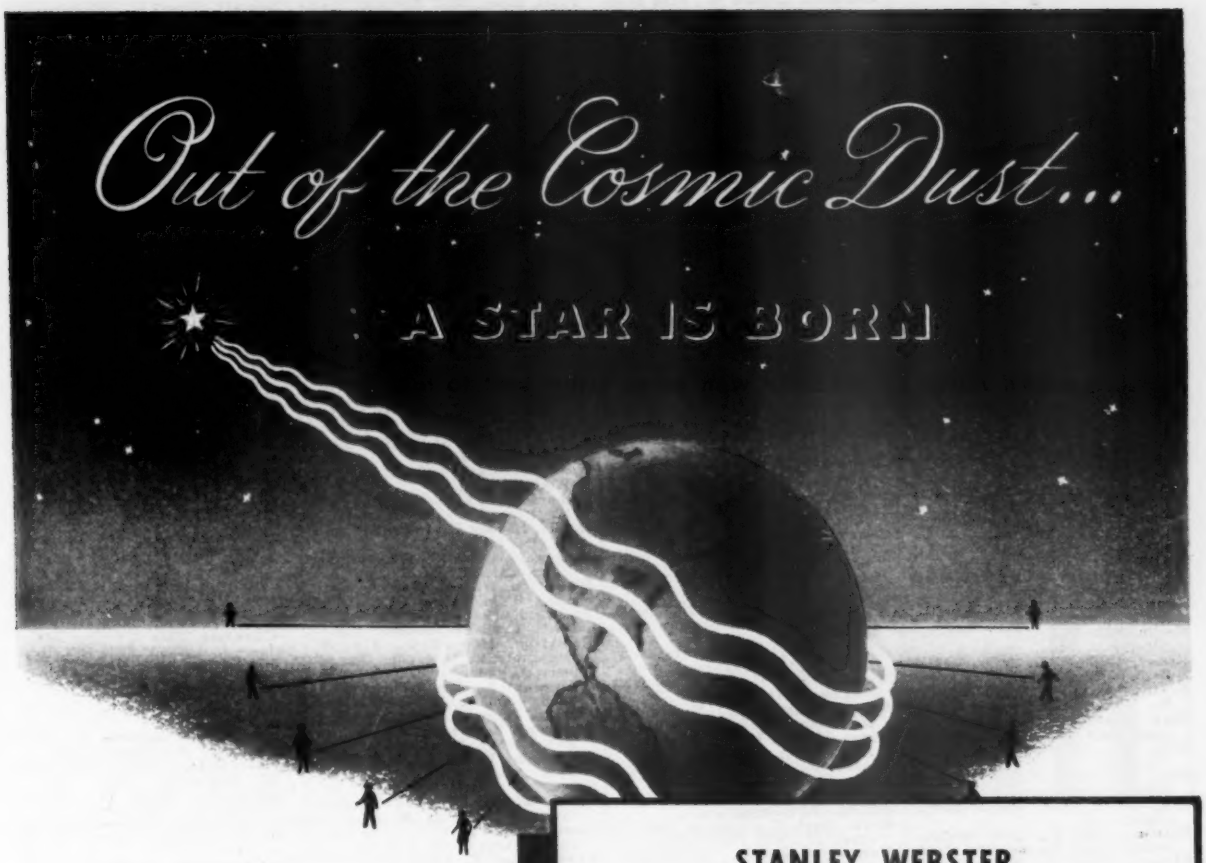

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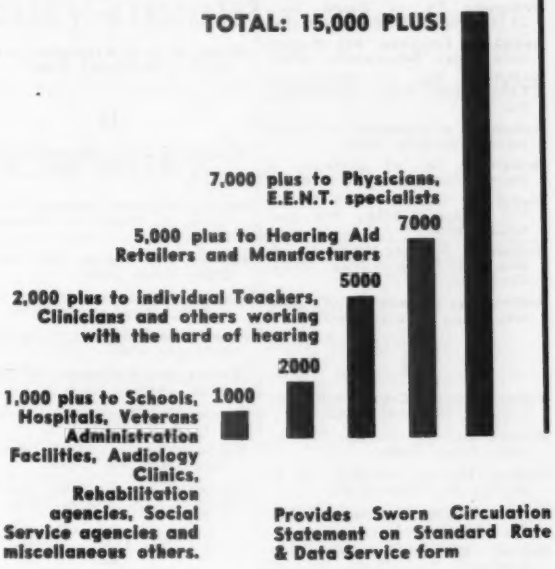
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It is trade-named the Telemaster and has been designated Model 17 to commemorate the firm's 17th year in

the hearing aid field. A report by an independent testing laboratory proves the unit gives ten times more power than previous 3-transistor aids, delivering up to 20 milliwatts of output. Range goes up to the equivalent of 140 decibels of sound pressure. Use of 5 transistors eliminates the overloading fault sometimes found in 3-transistor aids when maximum volume is desired, it is stated.

It is further stated that two different sets of batteries create a dual power range. When 65-70 db. gain is required, two 1¼ volt batteries are used; when required gain is 70-80 db., two 2½ volt batteries are needed.

Mowrer Story Arouses Nationwide Comment

In the September/October issue of Audecibel, we published a paper entitled "Incidence of Hearing Loss at 90 DB Level," written by Donald E. Mowrer, Speech and Hearing Therapist, Chippewa Local Schools, Doylestown, Ohio. As of November 15th, Mr. Mowrer wrote us as follows:

"I had no idea that Audecibel was so widely read!! The day after I received my copy, I also received seven letters of congratulation from my former professors and friends. I was very much surprised and also very much pleased. I also think this is a good sign that your publication is being read by people in the field of Speech and Hearing.

"For your interest, these letters came from the University of Georgia, Florida State University, Kent State University, Indiana University, EENT specialist of Wooster, Ohio, and the editor of the Journal of Communication.

"Since this was my first publication, you can imagine that I was quite proud to see my article in print. I think that you are doing much in the way of circulating scientific information to the professional people interested in hearing throughout this country.

"Again, I thank you for publishing my article. Also, thanks for the extra copies of Audecibel. I hope that sometime in the future, I will have another paper to submit for your journal."

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UNEX Model TR-3D
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AUDIVOX Models Super 67, 70
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GEM Model V-60
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OTARION Models B-15, B-30, F-1, F-3, H-1, Custom 5
PARAVOX Model D, J
RADIOEAR Model 62 Starlet, 72, 82
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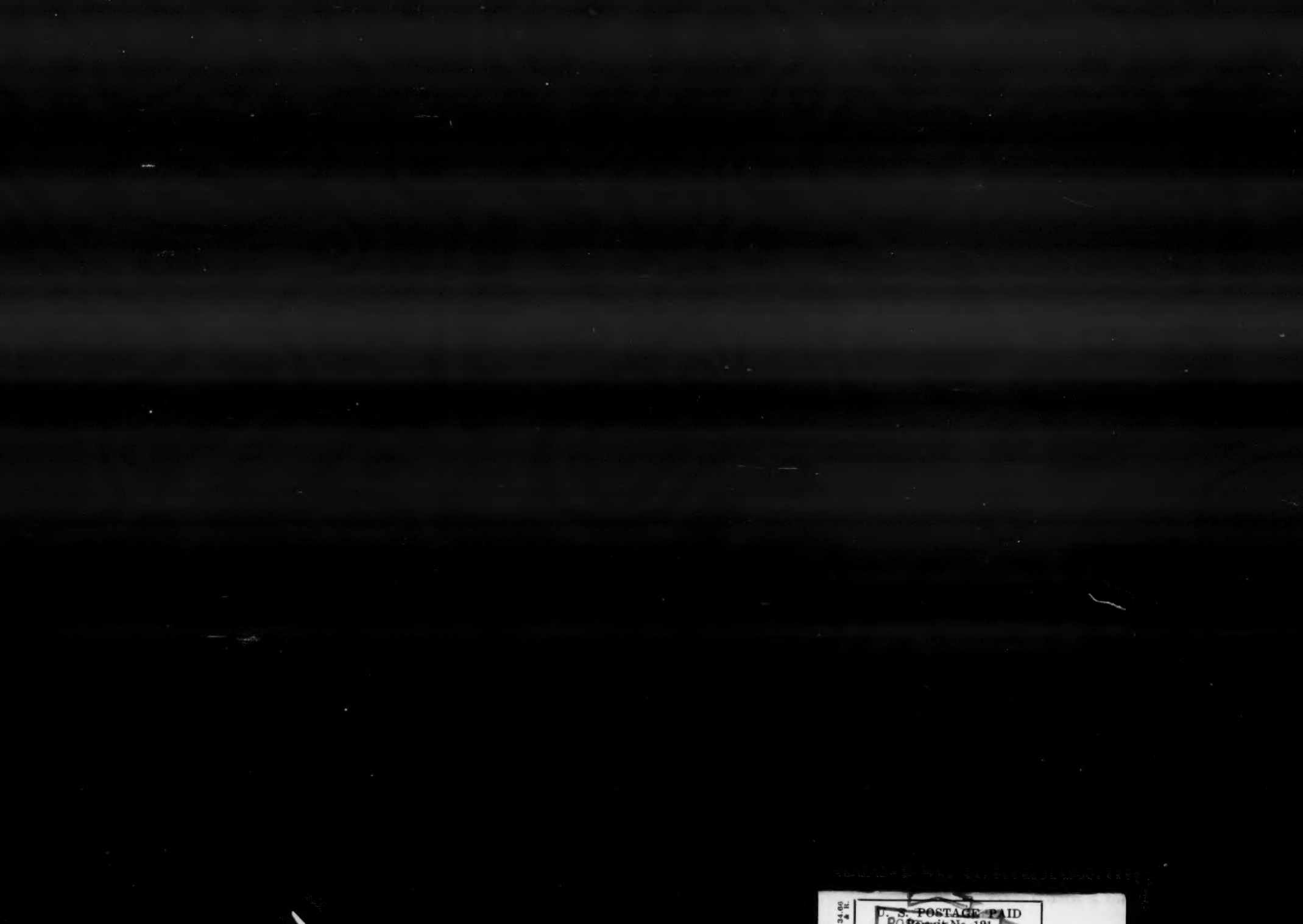
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